

Appl. No. 09/398,307

Amdt. with Request for RCE Dated July 10, 2006

Reply to Office Action Made Final dated April 10, 2006

Amendments to the Claims:

1. (Currently Amended) A method for managing channel assignment in a wireless communication system having a plurality of cells, each cell having a predetermined frequency band for use in establishing communication connections, said method comprising the steps of:

dividing the predetermined frequency band into a plurality of frequency sub-bands within at least one of the plurality of cells;

implementing a multiple access scheme within each of said plurality of frequency sub-bands;

specifying a power range for each of said plurality of frequency sub-bands, said power range representing a range of signal powers that are to be supported by one of a plurality of channels within each of said plurality of frequency sub-bands, wherein at least two of said plurality of frequency sub-bands are assigned power ranges that are different from one another;

upon receipt of a first communication connection in the wireless communication system, ascertaining a receive power level associated with a receive side of the first communication and a transmit power level associated with a transmit side of the first communication;

identifying at least one of said plurality of frequency sub-bands within the at least one cell that has a power range encompassing said receive power level;

assigning a channel within said at least one of said plurality of frequency sub-bands that has said power range encompassing said receive power level to said receive side of said first communication connection;

identifying at least one of said plurality of frequency sub-bands within the at least one cell that has a power range encompassing said transmit power level; and

assigning a channel within said at least one of said plurality of frequency sub-bands that has said power range encompassing said transmit power level to said transmit side of said first communication connection.

2. (Previously presented) The method claimed in claim 1, wherein:

said plurality of frequency sub-bands includes a first frequency sub-band having a plurality of code division multiple access (CDMA) channels.

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3. (Previously presented) The method claimed in claim 1, wherein:

said plurality of frequency sub-bands includes a first frequency sub-band having a plurality of time division multiple access (TDMA) channels.

4. (Currently Amended) The method claimed in claim 1, wherein said first communication connection is a communication connection with a remote entity, and wherein:

said step of ascertaining a receive power level and a transmit power level includes measuring a power level of a received connection request signal received from said remote entity via said first communication connection to determine a receive power level.

5. (Currently Amended) The method claimed in claim 1, wherein said first communication connection is a communication connection with a remote entity, and wherein:

said step of ascertaining a receive power level and a transmit power level includes determining a transmit power level required to communicate with a said remote entity in response to a connection request acknowledge signal received from said remote entity via said first communication connection.

6. (Previously presented) The method claimed in claim 1, wherein:

said wireless communication system includes a satellite communication system, wherein said predetermined frequency bandwidth represents a bandwidth available for communication between a satellite and a plurality of terrestrial users.

7. (Currently Amended) A system for providing wireless communication between a communication platform and a plurality of subscribers, said system comprising:

a predetermined frequency band for providing said wireless communication from a wireless cell, said predetermined frequency band being divided into a plurality of frequency sub-bands that are each capable of supporting a plurality of communication channels;

means for specifying a power range for each of said plurality of frequency sub-bands within the wireless cell, said power range representing a range of signal powers that are to be supported by one of a plurality of channels within each of said plurality of frequency sub-bands;

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means for determining a receive power level and a transmit power level associated with a wireless connection between said communication platform and one of the plurality of subscribers;

means for selecting at least one of said plurality of frequency sub-bands within the wireless cell that has a power range encompassing said receive power level determined by said means for determining;

means for assigning a channel within said at least one of said plurality of frequency sub-bands within the wireless cell that has said power range encompassing said receive power level determined by said means for determining to a receive side of said wireless connection for use in providing wireless communication between said one of said plurality of subscribers and said communication platform;

means for selecting at least one of said plurality of frequency sub-bands within the wireless cell that has a power range encompassing said transmit power level determined by said means for determining; and

means for assigning a channel within said at least one of said plurality of frequency sub-bands within the wireless cell that has said power range encompassing said transmit power level determined by said means for determining to a transmit side of said wireless connection for use in providing wireless communication between said communication platform and said one of said plurality of subscribers.

8. (Previously presented) The system claimed in claim 7, wherein:

said plurality of frequency sub-bands includes a first frequency sub-band having a plurality of code division multiple access (CDMA) channels.

9. (Previously presented) The system claimed in claim 7, wherein:

said plurality of frequency sub-bands includes a first frequency sub-band having a plurality of time division multiple access (TDMA) channels.

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10. (Previously presented) The system claimed in claim 7, further comprising:
means for monitoring said wireless connection to determine whether a power condition has changed during said wireless connection; and
means for assigning a new channel within a different frequency sub-band to said wireless connection when said means for monitoring determines that said power condition has changed.

11 (cancelled)

12. (Currently amended) A method for providing multiple access communications between a first location and a second location, said method comprising the steps of:

providing a predetermined frequency band for a wireless cell for use in establishing communication connections between said first location and said second location;

segmenting said predetermined frequency band within the wireless cell into a plurality of frequency sub-bands;

providing a multiple access scheme within each of said plurality of frequency sub-bands;

specifying a power range for each of said plurality of frequency sub-bands, said power range representing a range of signal powers that are to be supported by one of a plurality of channels within each of said plurality of frequency sub-bands;

determining power levels of received signals received from remote entities within the wireless cell to establish receive sides of wireless communication connections with said remote entities; and

assigning the received signals to frequency sub-bands having power ranges that encompass the power level of the received signal signals;

determining power levels for transmit signals for transmit sides of said wireless communication connections with said remote entities; and

assigning the transmit signals to frequency sub-bands having power ranges that encompass the power level determined for the transmit signals.

13. (Canceled)

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14. (Currently Amended) The method claimed in claim 12, wherein:
said limiting step of assigning the received signals includes determining said power level associated with a first receive side of one of said wireless communication ~~connection~~ connections and selecting one of said plurality of frequency sub-bands from said plurality of frequency sub-bands for use by said first receive side of said one of said wireless communication ~~connection~~ connections based on said power level.

15. (Currently Amended) The method claimed in claim 14, wherein:
said limiting step of assigning the received signals includes assigning a CDMA channel within said one of said plurality of frequency sub-bands to said first receive side of said one of said wireless communication ~~connection~~ connections.

16. (Currently Amended) The method claimed in claim 12, wherein:
said step of segmenting said predetermined frequency band into a plurality of frequency sub-bands includes defining a plurality of receive frequency sub-bands, and wherein
said step of assigning the received signals includes assigning the received signals to receive frequency sub-bands having power ranges that encompass the power level of the received signals.

17. (Currently Amended) The method claimed in claim 12, wherein:
said step of segmenting said predetermined frequency band into a plurality of frequency sub-bands includes defining a plurality of transmit frequency sub-bands, and wherein
said step of assigning the transmit signals includes assigning the transmit signals to transmit frequency sub-bands having power ranges that encompass the power level determined for the transmit signals.

18. (Cancelled)

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19. (Original) The method claimed in claim 12, wherein:

said first location includes a multi-channel communications satellite orbiting about a primary body.

20. (Original) The method claimed in claim 19, wherein:

said second location includes a footprint region on said primary body associated with said multi-channel communications satellite.

21. (Currently Amended) A method for providing multiple access communications between a first location and a second location, said method comprising the steps of:

providing a predetermined frequency band for a wireless cell at said second location for use in establishing communication connections between said first location and said second location;

dividing said predetermined frequency band within the wireless cell into a plurality of independent communication channels using at least two different multiple access methods;

separating said plurality of independent communication channels into a plurality of channel groups;

specifying a power range for each of said plurality of channel groups, said power range representing a range of signal powers that are to be supported by one of a plurality of channels within each of said plurality of channel groups;

determining a power level of a signal received at said first location from said wireless cell at said second location; and

assigning the signal to one of the plurality of channel groups having a power range that encompasses said power level for a receive side of one of said communication connections;

determining a transmit power level for a transmit side of the one of said communication channels; and

assigning a transmit signal to one of the plurality of channel groups having a power range that encompasses said transmit power level for the transmit side of the one of said communication connections.

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22. (Original) The method claimed in claim 21, wherein:

said at least two different multiple access methods includes frequency division multiple access (FDMA) and code division multiple access (CDMA).

23. (Original) The method claimed in claim 21, wherein:

said at least two different multiple access methods includes frequency division multiple access (FDMA) and time division multiple access (TDMA).

24. (Original) The method claimed in claim 21, wherein:

said at least two different multiple access methods includes time division multiple access (TDMA) and code division multiple access (CDMA).

25. (Original) The method claimed in claim 21, wherein:

said at least two different multiple access methods includes frequency division multiple access (FDMA), time division multiple access (TDMA), and code division multiple access (CDMA).

26. (Cancelled)

27. (Cancelled)

28. (New) The method claimed in claim 5, wherein said step of determining a transmit power level comprises the steps of:

receiving said connection request acknowledge signal from said remote entity in response to said remote entity receiving a connection request signal, said connection request acknowledge signal including a transmit power indication indicating a power level of said connection request signal as measured at said remote entity;

determining a transmit power level required to communicate with said remote entity in response to said transmit power indication.

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29. (New) The method claimed in claim 1, wherein said first communication connection is a communication connection with a remote entity, and wherein said step of ascertaining a receive power level and a transmit power level includes the steps of:

receiving a connection request acknowledge signal from said remote entity in response to said remote entity receiving a connection request signal, said connection request acknowledge signal including a transmit power indication indicating a power level of said connection request signal as measured at said remote entity;

determining a receive power level required to communicate with said remote entity by measuring a power level of said connection request acknowledge signal; and

determining a transmit power level required to communicate with said remote entity in response to said transmit power indication.

30. (New) The method claimed in claim 5, wherein said step of determining a transmit power level comprises the steps of:

transmitting a connection request signal to said remote entity at a predetermined transmit power level;

determining whether a connection request acknowledge signal has been received from said remote entity;

in response to a connection request acknowledge signal not being received from said remote entity, transmitting the connection request signal to said remote entity at an increased transmit power level.

31. (New) The method claimed in claim 30, wherein said step of transmitting the connection request signal at an increased transmit power level comprises the steps of:

increasing the transmit power level a predetermined power from a previous transmit power level to the increased transmit power level, wherein a previous connection request signal was transmitted to said remote entity at said previous transmit power;

transmitting a connection request signal to said remote entity at the increased transmit power level; and

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repeating the increasing and transmitting steps wherein the increased transmit power level for the previous transmitting step becomes the previous transmit power level for the increasing step, the increasing and transmitting steps repeated until a connection request acknowledge signal is received from said remote entity or the previous transmit power level is equivalent to a maximum transmit power level.

32. (New) The method claimed in claim 1, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said receive power level comprises more than one of said plurality of frequency sub-bands and wherein:

said step of assigning a channel to said receive side of said first communication connection includes assigning a channel within said more than one of said plurality of frequency sub-bands to said receive side of said first communication connection in response to a number of active communication connections on each of said more than one of said plurality of frequency sub-bands.

33. (New) The method claimed in claim 1, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said receive power level comprises more than one of said plurality of frequency sub-bands and wherein:

said step of assigning a channel to said receive side of said first communication connection includes assigning a channel within said more than one of said plurality of frequency sub-bands to said receive side of said first communication connection in response to a predetermined prioritization of said more than one of said plurality of frequency sub-bands.

34. (New) The method claimed in claim 1, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said transmit power level comprises more than one of said plurality of frequency sub-bands and wherein:

said step of assigning a channel to said transmit side of said first communication connection includes assigning a channel within said more than one of said plurality of frequency sub-bands to said transmit side of said first communication connection in response to a number

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of active communication connections on each of said more than one of said plurality of frequency sub-bands.

35. (New) The method claimed in claim 1, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said transmit power level comprises more than one of said plurality of frequency sub-bands and wherein:

said step of assigning a channel to said transmit side of said first communication connection includes assigning a channel within said more than one of said plurality of frequency sub-bands to said transmit side of said first communication connection in response to a predetermined prioritization of said more than one of said plurality of frequency sub-bands.

36. (New) The method claimed in claim 1, further comprising the steps of:

monitoring said receive power level associated with said receive side of the first communication by measuring said receive power level at predetermined intervals during said first communication connection to determine whether said receive power level has changed; and
assigning a new channel within said at least one of said plurality of frequency sub-bands that has said power range encompassing said measured receive power level to said receive side of said first communication connection in response to determining that said receive power level has changed.

37. (New) The method claimed in claim 1, wherein said first communication connection is a communication connection with a remote entity, the method further comprising the steps of:

monitoring said receive power level associated with said receive side of the first communication by measuring said receive power level at predetermined intervals during said first communication connection to determine whether said receive power level has changed; and
transmitting a transmit power modify signal to said remote entity in response to determining that said receive power level has changed, the transmit power modify signal instructing said remote entity to modify the transmit power thereof.

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38. (New) The method claimed in claim 1, wherein:

said step of specifying a power range for each of said plurality of frequency sub-bands includes respecifying a power range for each of said plurality of frequency sub-bands in response to time.

39. (New) The method claimed in claim 38, wherein:

said step of respecifying a power range for each of said plurality of frequency sub-bands includes respecifying a power range for each of said plurality of frequency sub-bands in response to whether the time is daytime or nighttime.

40. (New) The method claimed in claim 38, wherein:

said step of respecifying a power range for each of said plurality of frequency sub-bands includes respecifying a power range for each of said plurality of frequency sub-bands in response to whether the time is a weekday, a weekend day or a holiday.

41. (New) The system claimed in claim 7, wherein said means for determining a receive power level and a transmit power level comprises:

means for transmitting a connection request signal to said one of the plurality of subscribers at a predetermined transmit power level; and

means for determining whether a connection request acknowledge signal has been received from said one of the plurality of subscribers,

wherein said means for transmitting a connection request transmits a connection request signal to said one of the plurality of subscribers at an increased transmit power level in response to a connection request acknowledge signal not being received from said one of the plurality of subscribers.

42. (New) The system claimed in claim 41, wherein said means for transmitting a connection request repeatedly increases the transmit power level to an increased transmit power level and transmits a connection request to said one of the plurality of subscribers at the increased transmit power level until a connection request acknowledge signal is received from

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said one of the plurality of subscribers or the increased transmit power level is equivalent to a maximum transmit power level.

43. (New) The system claimed in claim 7, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said receive power level comprises more than one of said plurality of frequency sub-bands and wherein:

said means for assigning a channel to said receive side of said wireless connection assigns a channel within said more than one of said plurality of frequency sub-bands to said receive side of said wireless connection in response to a number of active connections on each of said more than one of said plurality of frequency sub-bands.

44. (New) The system claimed in claim 7, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said receive power level comprises more than one of said plurality of frequency sub-bands and wherein:

said means for assigning a channel to said receive side of said wireless connection assigns a channel within said more than one of said plurality of frequency sub-bands to said receive side of said wireless connection in response to a predetermined prioritization of said more than one of said plurality of frequency sub-bands.

45. (New) The system claimed in claim 7, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said transmit power level comprises more than one of said plurality of frequency sub-bands and wherein:

said means for assigning a channel to said transmit side of said wireless connection assigns a channel within said more than one of said plurality of frequency sub-bands to said transmit side of said wireless connection in response to a number of active connections on each of said more than one of said plurality of frequency sub-bands.

46. (New) The system claimed in claim 7, wherein said at least one of said plurality of frequency sub-bands having a power range encompassing said transmit power level comprises more than one of said plurality of frequency sub-bands and wherein:

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said means for assigning a channel to said transmit side of said wireless connection assigns a channel within said more than one of said plurality of frequency sub-bands to said transmit side of said wireless connection in response to a predetermined prioritization of said more than one of said plurality of frequency sub-bands.

47. The system claimed in claim 7 further comprising:

means for monitoring said receive side of said wireless connection to determine whether a power condition has changed during said wireless connection; and

transmitting a transmit power modify signal to said one of the plurality of subscribers in response to determining that said receive power level has changed, the transmit power modify signal instructing said one of the plurality of subscribers to modify the transmit power thereof.

48. (New) The system claimed in claim 7, wherein:

said means for specifying a power range for each of said plurality of frequency sub-bands respecifies a power range for each of said plurality of frequency sub-bands in response to time.

49. (New) The system claimed in claim 48, wherein:

said means for specifying a power range for each of said plurality of frequency sub-bands respecifies a power range for each of said plurality of frequency sub-bands in response to whether the time is daytime or nighttime.

50. (New) The system claimed in claim 48, wherein:

said means for specifying a power range for each of said plurality of frequency sub-bands respecifies a power range for each of said plurality of frequency sub-bands in response to whether the time is a weekday, a weekend day or a holiday.

51. (New) The method claimed in claim 12, wherein:

said step of assigning the transmit signals includes determining said power level associated with a transmit side of one of said wireless communication connections and selecting

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one of said plurality of frequency sub-bands from said plurality of frequency sub-bands for use by said transmit side of said one of said wireless communication connections based on said power level.

52. (New) The method claimed in claim 51, wherein:

said step of assigning the transmit signals includes assigning a CDMA channel within said one of said plurality of frequency sub-bands to said transmit side of said one of said wireless communication connections.

53. (New) The method claimed in claim 12, wherein said step of determining power levels for transmit signals comprises the steps of:

receiving connection request acknowledge signals from said remote entities in response to said remote entities receiving said connection request signals, said connection request acknowledge signals including transmit power indications indicating power levels of said connection request signals as measured at said remote entities;

determining power levels for transmit signals for transmit sides of said wireless communication connections with said remote entities in response to said transmit power indications.

54. (New) The method claimed in claim 53, wherein:

said step of determining power levels of received signals includes determining power levels of received signals by measuring power levels of said connection request acknowledge signals.

55. (New) The method claimed in claim 12, wherein said step of determining power levels for transmit signals comprises the steps of:

transmitting connection request signals to said remote entities at a predetermined transmit power level;

determining whether connection request acknowledge signals have been received from said remote entities;

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in response to said connection request acknowledge signals not being received from said remote entities, transmitting the connection request signals to said remote entities at an increased transmit power level.

56. (New) The method claimed in claim 55, wherein:

said step of transmitting the connection request signals at an increased transmit power level includes repeatedly transmitting the connection request signals at successively increased transmit power levels until connection request acknowledge signals are received from said remote entities or the increased transmit power level is equivalent to a maximum transmit power level.

57. (New) The method claimed in claim 16, wherein:

said step of assigning the received signals to receive frequency sub-bands includes the step of assigning the received signals to receive frequency sub-bands having power ranges that encompass the power level of the received signals in response to a number of active wireless communication connections on ones of said receive frequency sub-bands.

58. (New) The method claimed in claim 16, wherein:

said step of assigning the received signals to receive frequency sub-bands includes the step of assigning the received signals to receive frequency sub-bands having power ranges that encompass the power level of the received signals in response to a predetermined prioritization of said receive frequency sub-bands.

59. (New) The method claimed in claim 17, wherein:

said step of assigning the transmit signals to transmit frequency sub-bands includes the step of assigning the transmit signals to transmit frequency sub-bands having power ranges that encompass the power level of the transmit signals in response to a number of active wireless communication connections on ones of said transmit frequency sub-bands.

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60. (New) The method claimed in claim 17, wherein:

said step of assigning the transmit signals to transmit frequency sub-bands includes the step of assigning the transmit signals to transmit frequency sub-bands having power ranges that encompass the power level of the transmit signals in response to a predetermined prioritization of said transmit frequency sub-bands.

61. (New) The method claimed in claim 12, further comprising the steps of:

monitoring said power levels of the received signals by measuring said power levels at predetermined intervals during said wireless communication connections to determine whether said power levels have changed; and

assigning the received signals to new ones of said frequency sub-bands that have power ranges encompassing said measured power levels of the received signals in response to determining that said power levels have changed.

62. (New) The method claimed in claim 12, further comprising the steps of:

monitoring said power levels of the received signals by measuring said power levels at predetermined intervals during said wireless communication connections to determine whether said power levels have changed; and

transmitting transmit power modify signals to remote entities in response to determining that said power levels of the received signals received from the remote entities within the wireless cell has changed, the transmit power modify signals instructing the remote entities to modify the transmit power thereof.

63. (New) The method claimed in claim 12, wherein:

said step of specifying a power range for each of said plurality of frequency sub-bands includes respecifying a power range for each of said plurality of frequency sub-bands in response to time.

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64. (New) The method claimed in claim 63, wherein:

said step of respecifying a power range for each of said plurality of frequency sub-bands includes respecifying a power range for each of said plurality of frequency sub-bands in response to whether the time is daytime or nighttime.

65. (New) The method claimed in claim 63, wherein:

said step of respecifying a power range for each of said plurality of frequency sub-bands includes respecifying a power range for each of said plurality of frequency sub-bands in response to whether the time is a weekday, a weekend day or a holiday.

66. (Original) The method claimed in claim 21, wherein:

said first location includes a multi-channel communications satellite orbiting about a primary body.

67. (Original) The method claimed in claim 66, wherein:

said second location includes a footprint region on said primary body associated with said multi-channel communications satellite, said wireless located within said footprint region on said primary body.

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Claim Rejections

I. CLAIM REJECTION UNDER 35 USC §102(b)

The Examiner has rejected Claims 1, 2, 4, 5, 7, 8, 10, 12, 14 to 17, 21 and 22 under 35 USC §102(b) as being anticipated by Doner (US Patent No. 5,758,090).

II. CLAIM REJECTION UNDER 35 USC § 103(a)

The Examiner has rejected Claims 3, 6, 9, 19, 20 and 22 to 25 under 35 USC §103(a) as being unpatentable over Doner in view of Natarajan et al. (US Patent No. 5,749,044).